



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/696,254	10/29/2003	Hui Lin Chang	24061.36 (2002-0939)	7076
42717 7590 03/15/2007 HAYNES AND BOONE, LLP 901 MAIN STREET, SUITE 3100 DALLAS, TX 75202			EXAMINER ERDEM, FAZLI	
			ART UNIT	PAPER NUMBER
			2826	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		03/15/2007	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/696,254

Applicant(s)

CHANG, HUI LIN

Examiner

Fazli Erdem

Art Unit

2826

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 February 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 10-24, 26-29 and 32-37 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 10-23 and 32-37 is/are allowed.
- 6) ☒ Claim(s) 24 and 26-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, filed 2/26/2007, with respect to the rejection(s) of claim(s) 24, 26, 27 and 29 under 35 USC 102 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Gardner et al. (6,140,691) in view of Wong et al. (2004/0119163).

Allowable Subject Matter

1. Claims 10-23 and 32-37 allowed.
2. The following is a statement of reasons for the indication of allowable subject matter:

Regarding Claim 32-34, Prior art failed to establish combination of dielectric layers with the required dielectric constant relationships.

Regarding Claim 35-37, Prior art failed to establish contact area for landing yoke or mirror element or control bus, coated with Carbon Nitride with specific carbon and nitrogen concentration.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2826

4. Claims 24 and 26-29 rejected under 35 U.S.C. 103(a) as being unpatentable over Gardner et al. (6,140,691) in view of Wong et al. (2004/0119163).

Regarding Claim 24, Gardner et al. disclose a trench isolation structure having a low K dielectric material isolated from silicon-based substrate where in Fig. 11B it discloses a plurality of doped regions 80/82 formed in a substrate 50 and a plurality of isolation regions (although only one isolation region is shown in the Figure, the Figure is continuous, i.e. there are additional isolation regions to the left and the right side of the figure) each approximated a junction of adjacent ones of the plurality of doped regions 80/82. Gardner et al. disclose that layer 64 which is part of the shallow trench isolation structure of 70 is carbon based. Gardner et al. fail to disclose layer 64 to be carbon nitride. However, Wong et al. disclose a method of making semiconductor devices using carbon nitride, a low-dielectric-constant hard mask and/or etch stop where in Figs. 4B and 8, layer 210 is a carbon nitride barrier/cap/hardmask layer and it would normally extend to the position where the layer 64 of Gardner et al. is located.

It would have been obvious to one of having ordinary skill in the art at the time the invention was made to include the required carbon nitride barrier/hardmask/cap layer in Gardner et al. as taught by Wong et al. in order to provide a low k dielectric material with increase mechanical strength as shown in paragraph [0007] of Wong et al.

Regarding Claim 26, elements 80/82 to the right and the left of transistor 72 in Fig. 11B of Gardner et al. are oppositely doped.

Art Unit: 2826

Regarding Claim 27, element 70 in Gardner et al. Fig. 11b is a trench isolation structure.

Regarding Claim 28, paragraph [0022] of Wong et al. disclose the required ratio for Carbon and Nitrogen.

Regarding Claim 29, paragraph [0022] of Wong et al. disclose the amorphous carbon nitride layer.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fazli Erdem whose telephone number is (571) 272-1914. The examiner can normally be reached on M - F 8:00 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sue Purvis can be reached on (571) 272-1236. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2826

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

FE

March 8, 2007


SUE A. PURVIS
SUPERVISORY PATENT EXAMINER